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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/763,383

01/26/2004

Giora Dishon

DISHON1

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05/04/2005

BROWDY AND NEIMARK, P.L.L.C.

624 Ninth Street, N.W.

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EXAMINER

MATHEWS, ALAN A

ART UNIT

PAPER NUMBER

2851

DATE MAILED: 05/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

SM

Office Action Summary

Application No.

10/763,383

Applicant(s)

DISHON ET AL.

Examiner

Alan A. Mathews

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-18 and 21-30 is/are rejected.
- 7) ☒ Claim(s) 19 and 20 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 09/184,727.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>4-16-04</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1- 15 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-20 of U.S. Patent No. 6,166,801. Although the conflicting claims are not identical, they are not patentably distinct from each other because claim 1, lines 1 and 2, of U.S. Patent No. 6,166,801 disclose an apparatus for use in a photolithography process applied to substrates. Claim 1, lines 5 and 6 of U.S. Patent No. 6,166,801 disclose a photoresist coating unit. Claim 1, line 15 of U.S. Patent No. 6,166,801 discloses a monitoring system. Claim 1, line 26 of U.S. Patent No. 6,166,801 discloses an optical monitoring station. Claim 9, line 2 of U.S. Patent No. 6,166,801 discloses a control unit. Claim 1, line 20 of U.S. Patent No. 6,166,801 discloses a supporting assembly. Claim 1, line 26

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of U.S. Patent No. 6,166,801 discloses an optical assembly. Claim 4, lines 2 and 3 of U.S. Patent No. 6,166,801 disclose applying optical measurements. Claim 1, line 16 of U.S. Patent No. 6,166,801 discloses determining at least one parameter. Claim 2 of U.S. Patent No. 6,166,801 discloses the elements of claim 2 in the instant application. Claim 3 of U.S. Patent No. 6,166,801 discloses the elements of claim 3 in the instant application. Claim 4 of U.S. Patent No. 6,166,801 discloses the elements of claim 4 in the instant application. Claim 5 of U.S. Patent No. 6,166,801 discloses the elements of claim 5 in the instant application. Claim 6 of U.S. Patent No. 6,166,801 discloses the elements of claim 6 in the instant application. Claim 1, lines 22-23 of U.S. Patent No. 6,166,801 discloses the elements of claim 7 in the instant application. Claim 7 of U.S. Patent No. 6,166,801 discloses the elements of claim 8 in the instant application. Claim 9 of U.S. Patent No. 6,166,801 discloses the elements of claims 9 and 10 in the instant application. Claim 10 of U.S. Patent No. 6,166,801 discloses the elements of claim 13 in the instant application. Claims 12 and 13 of U.S. Patent No. 6,166,801 discloses the elements of claims 14 and 15 in the instant application. Thus, claims 1 – 20 of U.S. Patent No. 6,166,801 discloses claims 1- 15 of the instant application except for specifically reciting a phototrack and that the optical monitoring station is configured so as to be physically combined inside the foot print of the phototrack tool arrangement. But claims 1-20 of U.S. Patent No. 6,166,801 disclose all the elements of the phototrack tool. And the optical monitoring station is within these elements. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide the monitoring system within foot print of a phototrack tool arrangement for the purpose of confining all elements of the invention within a single area or device and thus be smaller and easier to handle.

3. Claims 1-6 and 13 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-37 of U.S. Patent No. 6,603,529. Although the conflicting claims are not identical, they are not patentably distinct from each other because Claim 1, lines 1 and 2 of U.S. Patent No. 6,603,529 discloses an apparatus for use in a photolithography processes applied to substrates. Claim 1, lines 5 and 6 of U.S. Patent No. 6,603,529 discloses a photoresist coating unit. Claim 1, line 11 of U.S. Patent No. 6,603,529 discloses a developing unit. Claim 1, line 15 of U.S. Patent No. 6,603,529 discloses a monitoring system. Claim 12, line 2 of U.S. Patent No. 6,603,529 discloses a control unit. Claim 2 of U.S. Patent No. 6,603,529 discloses the elements of claim 2 in the instant application. Claim 3 of U.S. Patent No. 6,603,529 discloses the elements of claim 3 in the instant application. Claim 4 of U.S. Patent No. 6,603,529 discloses the elements of claim 5 in the instant application. Claim 5 of U.S. Patent No. 6,603,529 discloses the elements of claim 6 in the instant application. Claim 13 of U.S. Patent No. 6,603,529 discloses the elements of claim 13 in the instant application. Thus, claims 1 – 37 of U.S. Patent No. 6,603,529 discloses claims 1- 6 and 13 of the instant application except for specifically reciting a phototrack and that the optical monitoring station is configured so as to be physically combined inside the foot print of the phototrack tool arrangement. But claims 1-37 of U.S. Patent No. 6,603,529 disclose all the elements of the phototrack tool. And the optical monitoring station is within these elements. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide the monitoring system within foot print of a phototrack tool arrangement for the purpose of

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confining all elements of the invention within a single area or device and thus be smaller and easier to handle.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-3, 5, 6, 25, 28, and 29 are rejected under 35 U.S.C. 102(e) as being anticipated by Akimoto et al. (U. S. Patent No. 6,004,047). Akimoto et al. '047 discloses in figure 1 a phototrack tool arrangement 1. Figures 10 and 11, and column 11, lines 39-67, and column 12, lines 1-30, disclose a photoresist coating unit COT and a developing unit DEV. Column 11, lines 52 and 53 also disclose an exposure unit (station), although the exposure unit is not shown in the drawing. Figures 15A, 15B, 16, and 17, and column 15, lines 5-67, and column 16, disclose a monitoring system (station) 101 monitoring the parameter of film thickness. The control unit is CPU 102. Column 16, lines 42-55, discloses incorporating the monitoring station into the coating/developing system. This would be the same thing as physically combining the monitoring system inside the foot print of the phototrack tool arrangement. With respect to claim 2, column 16, line 53 discloses a transfer device 126 for transferring the substrate to the

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monitoring station. It is also noted that elements 122 and 124 in figure 10 are also transfer devices. With respect to claim 5, the defects in the substrate could be a film thickness which has **exceeded** the appropriate range. With respect to claims 1 and 25, column 16, lines 52-57, specifically recites a specimen table (support assembly). With respect to claim 6 and claim 29, the film thickness is considered to be a critical dimension.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 4, 9, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akimoto et al. (U. S. Patent No. 6,004,047) as applied to claims 1 and 25 above, and further in view of Kawai (U. S. Patent No. 5,877,036) or Mazor (U. S. Patent No. 5,438,413). Akimoto et al. discloses substantially the invention claimed except for specifically disclosing an optical monitoring system for detecting overlay registration error. Kawai discloses in figure 5 a coating station, an exposing station, and a developing station. Figure 5 also discloses a superposition measuring station (step S18), which is a system for detecting overlay registration errors in the alignment for the well known purpose of more accurate registration and improved integrated

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circuits. Mazor et al. discloses a station measuring overlay misregistration during wafer fabrication. Mazor et al. further discloses camera (imaging device) 72 in figure 5. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide Akimoto et al. with an optical monitoring system for detecting overlay registration errors in view of either Kawai or Mazor et al. for the purpose of more accurate registration and improved integrated circuits.

8. Claims 6, 26, 29, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akimoto et al. (U. S. Patent No. 6,004,047) as applied to claim 1 and 25 above, and further in view of the article entitled "Seeing the forest for the trees: a new approach to CD control" (cited in Applicant's PTO-1449, hereafter referred to as "the CD control article"). Akimoto et al. discloses the invention except for specifically stating that it's monitoring system is configured for detecting critical dimensional errors (although the Examiner has argued that film thickness is a critical dimensional error). The CD control article discloses detecting critical dimensional errors in the developed pattern of the photoresist. The CD control article discusses target lines and line widths on page 3. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to Akimoto et al. with a monitoring system for detecting critical dimensional errors in view of the CD control article for the purpose of improving the quality of the wafers and thus improve the final product.

9. Claims 7, 8, 12, 16-18, and 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akimoto et al as applied to claim 1 above, and further in view of Moore et al.

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(U. S. Patent No. 5,872,632). Akimoto et al. discloses in figures 15A, 15B, 16, and 17, and column 15, lines 5-67, and column 16, a monitoring system (station) 101 monitoring the parameter of film thickness. The control unit is CPU 102. Thus, Akimoto et al. discloses the invention except for disclosing an optical assembly accommodated within an enclosure having a transparent window aligned with and facing a plate supporting the substrate outside the enclosure. Moore discloses in figures 3-5 and column 3, lines 35-58, and column 5, lines 38-45, using thickness measurement apparatus 201 to measure layer thickness. Figure 4 discloses the thickness measuring apparatus in enclosure 230 with windows at the bottom. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to Akimoto et al. with a thickness measuring apparatus in an enclosure in view of Moore et al. for the well-known purpose of improved accuracy in measurement. With respect to claims 8 and 12, it is old and well known to have light sources and/control units outside enclosures for the purpose of increased flexibility in building the apparatus. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to the modified device of Akimoto et al. and Moore et al. with a light source and a control unit outside the enclosure in view of this old and well known concept. With respect to claims 16-18 and 21-24, figure 4 of Moore et al. discloses a rotating supporting plate 220 for the wafer. In any case, there is relative movement between the optical assembly and the supporting plate.

Allowable Subject Matter

10. Claims 10, 11, 13-15 are rejected under double patenting, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims and subject to filing a proper terminal disclaimer. Claims 19 and 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The reasons for the indicated allowability of the claims are as follows:

The prior art does not disclose or suggest an optical assembly and said imaging device are located within a sealed enclosure having a transparent window aligned with and facing a plate supporting the substrate outside said sealed enclosure, thereby enabling inspecting the supported substrate via the transparent window in combination with all the other elements recited in the parent claims to dependent claim 9.

The prior art does not disclose or suggest wherein said optical assembly includes a low magnification channel for aligning the optical assembly with respect to the substrate on a supporting plate; and a high-magnification channel for measuring predetermined parameters of the photolithography process after the substrate has passed through the developing unit and before reaching an unloading station in combination with all the other elements recited in the parent claim to dependent claim 13.

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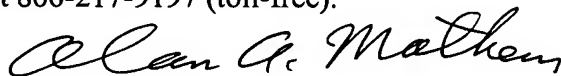
Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The patents cited in the PTO-1449 are cited for the same reasons they were cited in Applicant's IDS. The patents to Grodnensky et al. and Ausschnitt et al. is cited to show measurement of critical dimensions on a substrate.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alan A. Mathews whose telephone number is (571) 272-2123. The examiner can normally be reached on Monday through Friday from 8:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on (571) 272-2258. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Alan A. Mathews
Primary Examiner
Art Unit 2851

AM